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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/786,553	03/07/2001	Cedric Lapaille	Q63090	3727

7590 12/20/2004

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EXAMINER	
PERILLA, JASON M	
ART UNIT	**PAPER NUMBER**
2634	

DATE MAILED: 12/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/786,553	LAPAILLE ET AL.
	Examiner	Art Unit
	Jason M Perilla	2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 July 2004.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1 and 3-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,3-12,14 and 15 is/are rejected.

7)☒ Claim(s) 13 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 07 March 2001 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1, and 2-15 are pending in the instant application.

Drawings

2. The drawings are objected to because the blocks in figure 1 are not properly text labeled to assist in the understanding of the invention. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Response to Arguments/Amendments

3. Applicant's arguments filed July 22, 2004 have been fully considered but they are not persuasive.

Regarding the combination of claims 1 and 3 and the alleged patentability of the instant amended claim 1 with respect to the prior art rejection of Wang (US 5918184) in view of Dapper et al (US 5809065; hereafter "Dapper") (see page 11), the Examiner affirms that the rejection of claim 3 in the first action of April 4, 2004 was proper, and it also applies to the instant amended claim 1. The Applicant points out that the Dapper does not explicitly disclose that the filtering of the noise signal is based on a statistical distribution over a predetermined time period during which a representative but practically stationary group of noise signal samples is evaluated. However, while Dapper may not disclose explicitly such limitations, the reasons for the combination of Wang and Dapper are exclusive of such teachings. Rather, Dapper teaches the use of an average as an alternative to a filter in a strictly analogous signal-to-noise determination method. The Examiner affirms that one having skill in the art would indeed be motivated to *at least* consider the averaging of Dapper to be a possible advantageous alternative to the filter of Wang. Alternatively, the averaging of Dapper could be considered, as broadly as claimed, to be filtering if the reference Dapper was applied alone to claim 1. Further, the limitations including, "a statistical distribution", "statistically representative", "for a predetermined period", and "practically stationary" are not considered to be particularly narrowing limitations for the reasons set forth below.

Claim Objections

4. Claim 4 objected to because of the following informalities:

Regarding claim 4, in line 3, "exceeds that the noise" should be replaced by – exceeds the noise--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 2, 8, 9, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 5918184 – previously cited).

Regarding claim 1, Wang discloses a method of estimating the signal-to-noise ratio of a digital signal (abstract; col. 3, lines 10-15), received by a radiocommunications receiver (fig. 1), the method comprising: estimating separately a wanted signal (col. 4, lines 4-11) and a noise signal (fig. 1, col. 4, lines 12- 52) of the digital signal; filtering separately (fig. 1, refs. 34 and 42) the wanted signal and the noise signal; and determining the signal-to-noise ratio by dividing or comparing (col. 4, lines 53-58) the wanted signal which has been filtered by the noise signal which has been filtered. Wang discloses the use of a comparator for the division of the signal by the noise. However, to one of ordinary skill in the art, it is would have been obvious that the signal-to-noise ratio is found by the division of the signal by the noise. Hence, it is obvious to one having ordinary skill in the art that the comparator may be replaced or is functionally equivalent to a division component. Further, Wang discloses filtering of the noise

signal, but does not explicitly disclose that the filtering of the noise signal comprises determining a noise value which is used to determine the signal-to-noise ratio based on a statistical distribution of noise power measurements for a predetermined period during which a statistically representative number of noise power measurement samples is collected and which is sufficiently short for the noise signal to remain practically stationary. However, the impulse response filter component of Wang will inherently perform on a distribution or at least more than one measurement sample for a predetermined period (also inherent) as understood by one having skill in the art. A finite impulse response or infinite impulse response filter is responsive to more than one sample. A "statistical" distribution, as broadly as claimed, is considered to be a distribution. The time period during which a representative number of samples is taken, as broadly as claimed, is supported by the filter response of Wang. Finally, for the utility of the signal-to-noise measurement of Wang, it would have been obvious to one having ordinary skill in the art to utilize a sufficiently short number of measurement samples for the noise signal to remain practically stationary because the purpose of the signal-to-noise measurement is to determine a signal-to-noise measurement during a time period short enough that substantial changes in a communication channel do not take place. In other words, it is obvious to one having ordinary skill in the art that the filtering is performed over a time period which is sufficiently short enough that the noise is not substantially altering over a broad period of time.

Regarding claim 2, Wang discloses the limitations of claim 1 as applied above. Further, Wang discloses that the filtering of the noise signal (fig. 1, ref. 42; col. 4, lines 35-53) is different from that of the wanted signal (fig. 1, ref. 34, col. 4, lines 8-11). .

Regarding claim 8, Wang discloses the limitations of claim 1 as applied above. Further, Wang discloses that a finite or infinite impulse response low-pass filter is used to filter the noise signal (fig. 1, ref. 42; col. 4, lines 35-53).

Regarding claim 9, Wang discloses the limitations of claim 1 as applied above. Further, Wang discloses that the filter for the noise signal (fig. 1, ref. 42; col. 4, lines 35-53) comprises both an IIR and an FIR filter, but discloses the filter for the wanted signal to be an IIR filter (fig. 1, ref. 34, col. 4, lines 8-11). However, Wang teaches, in reference to the filter for the noise signal, that an FIR filter affords the advantage of greater linearity as compared to IIR filters. Therefore, it would have been obvious to utilize a pure FIR filter as taught by Wang in reference to the noise filter for the filter of the wanted signal because is could advantageously be used if a filter having greater linearity is required.

Regarding claim 11, Wang discloses the limitations of claim 9 as applied above. Further, Wang discloses that the transmitter provides a reference signal or supervisory audio tone (SAT) with a regular period at a particular level and reference signal is utilized as the wanted signal to estimate the signal-to-noise ratio (col. 1, lines 27-43).

Regarding claim 12, Wang discloses the limitations of claim 1 as applied above. Further, Wang discloses that an infinite impulse response filter is used to filter the estimate of the wanted signal (fig. 1, ref. 34, col. 4, lines 8-11).

7. Claims 1, 2, 4, 5, 6, 9, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Dapper et al (US 5809065 - previously cited; hereafter "Dapper").

Regarding claim 1, Wang discloses a method of estimating the signal-to-noise ratio of a digital signal (abstract; col. 3, lines 10-15), received by a radiocommunications receiver (fig. 1), the method comprising: estimating separately a wanted signal (col. 4, lines 4-11) and a noise signal (fig. 1, col. 4, lines 12- 52) of the digital signal; filtering separately (fig. 1, refs. 34 and 42) the wanted signal and the noise signal; and determining the signal-to-noise ratio by dividing or comparing (col. 4, lines 53-58) the wanted signal which has been filtered by the noise signal which has been filtered. Wang discloses the use of a comparator for the division of the signal by the noise. However, to one of ordinary skill in the art, it is would have been obvious that the signal-to-noise ratio is found by the division of the signal by the noise. Hence, it is obvious to one having ordinary skill in the art that the comparator may be replaced or is functionally equivalent to a division component. Further, Wang discloses filtering of the noise signal, but does not explicitly disclose that the filtering of the noise signal comprises determining a noise value which is used to determine the signal-to-noise ratio based on a statistical distribution of noise power measurements for a predetermined period during which a statistically representative number of noise power measurement samples is collected and which is sufficiently short for the noise signal to remain practically stationary. However, Dapper teaches a closely analogous method (fig. 2, ref. 28; col. 2, lines 34-67) of estimating a signal-to-noise ratio as disclosed in figure 2. Dapper

teaches that a wanted signal (22) and noise (24) may be averaged (refs. 28 and 34) before dividing (38). Because Dapper et al teaches that the average of the noise (fig. 2, ref. 30) is taken before it divides (fig. 2, ref. 38) the signal (fig. 2, ref. 36), it is inherent that the statistical distribution of the noise power measurements is observed for a particular period during which a statistically representative number of measurement samples is collected and which is sufficiently short for the noise to remain practically stationary. An average is, by definition, an observation of a statistical distribution. Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to utilize an average of the noise signal over an observation period as taught by Dapper in place of the noise filter of Wang because the average of the noise signal over an observation period of the statistical distribution of the noise signal samples is a good representation of the noise for finding the SNR.

Further regarding claim 1, in the combination of Wang in view of Dapper, the averaging component of Dapper will inherently perform an average on a distribution or at least more than one measurement sample for a predetermined period (also inherent) as defined by the term average. A "statistical" distribution, as broadly as claimed, is considered to be a distribution. The average taken over a period during which a representative number of samples is taken is obvious in view of the utility and definition of an average as taught by Ikeda. Finally, for the utility of the signal-to-noise measurement of Wang in view of Dapper, it would have been obvious to one having ordinary skill in the art to utilize a sufficiently short number of measurement samples for the noise signal to remain practically stationary because the purpose of the signal-to-

noise measurement is to determine a signal-to-noise measurement during a time period short enough that substantial changes in a communication channel do not take place. In other words, it is obvious to one having ordinary skill in the art that the average is taken over a time period which is sufficiently short enough that the noise is not substantially altering over a broad period of time.

Regarding claim 2, Wang in view of Dapper disclose the limitations of claim 1 as applied above. Further, Wang discloses that the filtering of the noise signal (fig. 1, ref. 42; col. 4, lines 35-53) is different from that of the wanted signal (fig. 1, ref. 34, col. 4, lines 8-11). Although some aspects of the filter for the wanted signal and the filter for the noise signal may be similar, they are not the same as disclosed by Wang. Further, in the case of Wang in view of Ikeda, the wanted signal is filtered and the noise signal is averaged.

Regarding claim 4, Wang in view of Dapper disclose the limitations of claim 1 as applied above. Further, it is inherent that the "noise average" is determined such that a probability that an instantaneous noise level exceeds the noise value is less than a predetermined threshold during the predetermined period. For instance, in the case that the observation period of the statistical distribution of the noise samples yields *the average* of the noise samples as the "noise average" for calculation of the SNR, *the average* is the predetermined threshold and the probability that an instantaneous noise level exceeds the predetermined threshold is approximately one half.

Regarding claim 5, Wang in view of Dapper disclose the limitations of claim 1 as applied above. Further, it is obvious that the "noise value" derived during the

observation period of the statistical distribution of the noise signal samples for calculation of the SNR would be chosen to be the maximum noise signal sample over the observation period. In this case, the most robust system possible could be acquired. Because the choice of the "noise value" is the largest of the noise signal samples over the observation period, the SNR would be the lowest possible for the channel conditions. Thereby, the system would adapt to use the most transmission power from the transmitters and would utilize the least number of available channels to allow for the best possible reception between users.

Regarding claim 6, Wang in view of Dapper disclose the limitations of claim 1 as applied above. Further, Dapper et al discloses calculating the average of the statistical distribution during the observation period (fig. 2, ref. 28; col. 2, lines 34-67). The average is a moment of the distribution. Further, Dapper et al makes reference to the calculation of the variance of the noise (col. 2, lies 59-60). Therefore, Dapper et al discloses that the moments of the distribution are determined.

Regarding claim 9, Wang in view of Dapper disclose the limitations of claim 1 as applied above. Further, Wang discloses that the filter for the noise signal (fig. 1, ref. 42; col. 4, lines 35-53) comprises both an IIR and an FIR filter, but discloses the filter for the wanted signal to be an IIR filter (fig. 1, ref. 34, col. 4, lines 8-11). However, Wang teaches, in reference to the filter for the noise signal, that an FIR filter affords the advantage of greater linearity as compared to IIR filters. Therefore, it would have been obvious to utilize a pure FIR filter as taught by Wang in reference to the noise filter for

the filter of the wanted signal because is could advantageously be used if a filter having greater linearity is required.

Regarding claim 11, Wang in view of Dapper disclose the limitations of claim 9 as applied above. Further, Wang discloses that the transmitter provides a reference signal or supervisory audio tone (SAT) with a regular period at a particular level and the signal-to-noise ratio is estimated from that reference signal (col. 1, lines 27-43).

Regarding claim 12, Wang in view of Dapper disclose the limitations of claim 1 as applied above. Further, Wang discloses that an infinite impulse response filter is used to filter the estimate of the wanted signal (fig. 1, ref. 34, col. 4, lines 8-11).

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Arens et al (US 5301364 - previously cited; hereafter "Arens").

Regarding claim 10, Wang discloses the limitations of claim 9 as applied above. Wang does disclose the use of an FIR filter, but does not disclose that the FIR filter is an averaging FIR filter. However, Arens teaches a FIR filter being an averaging filter (col. 6, lines 10-14). Further, the use of FIR filters as averaging filters is well known and understood in the art, and it is obvious that the use of an averaging filter would be applied because the average of the wanted signal would be used for calculating the SNR. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize a averaging FIR filter as taught by Arens in the method of Wang because the average of the wanted signal could be effectively used to calculate the SNR.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Buternowsky et el (US 5809090 - previously cited; hereafter "Buternowsky").

Regarding claim 14, Wang discloses the limitations of claim 12 as applied above. Wang does not disclose that packets are received and subsequently filtered. However, one skilled in the art is notoriously aware of the use of packets in digital transmission. Further, as reference to the use of packets in digital communications, Buternowsky discloses the use of packets in a digital communications method (col. 5, lines 1-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize packets in the digital communication method as exemplified by Buternowsky in the method of Wang because it provides an exemplary means of transmitting digital data well known in the art.

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Davidovici et al (US 5719898 – previously cited; hereafter "Davidovici").

Regarding claim 15, Wang discloses the limitations of claim 1 as applied above. Wang does not disclose estimating the signal-to-noise ratio in a telecommunications receiver for sending data to the respective transmitter for controlling a transmit power of a transmitter based on the signal to noise ratio. However, Davidovici teaches a method wherein the signal-to-noise ratio information at the receiver is used to alter the transmission power of the corresponding transmitter (col. 3, line 10-col. 4, line 60). Davidovici et al teaches that the method provides an adaptive transmission system in fading environments (col. 3, lines 9-11). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to transmit

signal-to-noise data from the receiver to the transmitter to adaptively vary the transmission power of the transmitter over a fading channel as described by Davidovici in the method of Wang because it would provide for an adaptive system in a channel which many vary.

Allowable Subject Matter

11. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M. Perilla
December 9, 2004

jmp

CHIEH M. FAN
PRIMARY EXAMINER